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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MATTIS, JASON E	

ART UNIT	PAPER NUMBER
2616	

DATE MAILED: 06/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

10

Office Action Summary	Application No.	Applicant(s)	
	10/791,466	DOUGLAS ET AL.	
	Examiner	**Art Unit**	
	Jason E. Mattis	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-6,8-12,14-18 and 20-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-6, 8-12, 14-18, and 20-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the After Final Amendment filed 4/27/06. Claims 1, 7, 13, and 19 have been cancelled. Claims 2-6, 8-12, 14-18, and 20-24 are currently pending in the application. Due to the amendment, prosecution has been reopened and the action is made non-final. New grounds for rejection have been made, as shown below, based on the newly cited publication Chuang et al. (U.S. Publication US 2005/0054296 A1), which shows a method of determining throughput based on multiplying capacity, rate, and interference indicators. Since interference is a type of cell loading indicator, the Chuang et al. publication discloses the claimed step of "wherein determining said client throughput comprises multiplying said capacity indicator by said data rate indicator and said cell loading indicator." It is recommended that the independent claims be amended such that the definition of the term "cell loading indicator" in the claims more specifically points out what is meant by this term. For example, it is shown on page 21 of the Applicant's specification that a cell loading factor is calculated based directly on the current number of clients in communication with an access point.

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 8, 14, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rappaport et al. (U.S. Publication US 2004/0259555 A1) in view of Choi et al. (U.S. Publication US 2004/0106410 A1), Nelson Jr., et al. (U.S. Publication US 2002/0159395), Rappaport et al. (U.S. Publication 2004/0236547 A1), and Chuang et al. (U.S. Publication 2005/0054296 A1).

With respect to claims 2, 8, 14, and 20, Rappaport et al. '555 discloses a method of assessing communications quality in a wireless network comprising a plurality of access points **(See the abstract of Rappaport et al. '555 for reference to a method for the design, predication, and control of wireless communication networks)**. Rappaport et al. '555 also discloses that the method is implemented using a computer that comprises a processor executing a computer code stored on a computer readable medium **(See page 1 paragraph 3 of Rappaport et al. '555 for reference to using a computerized system to predict and manage network performance characteristics)**. Rappaport et al. '555 further discloses receiving as input path loss information indicating path losses between a selected client of the

wireless network and the access points **(See page 10 paragraph 76 of Rappaport et al. '555 for reference to measuring RSSI, or a received signal strength that corresponds to path loss information, from access points at a client location)**. Rappaport et al. '555 also discloses determining a capacity indicator that estimates communication impairment for the client due to contention or collision **(See pages 10-11 paragraph 83 and Figure 7 of Rappaport et al. '555 for reference to predicting a SIR, or interference level that corresponds to an estimate of communication impairment for the client due to contention or collision)**. Rappaport et al. '555 does not specifically disclose that the capacity indicator is determined based on the path loss information. Although Rappaport et al. '555 does disclose determining multiple RF channel characteristics **(See pages 10-11 paragraph 83 and Figure 7 of Rappaport et al. '555 for reference to determining RSSI, SIR, SNR, Delay Spread, and Other RF Channel Characteristics)**, Rappaport et al. '555 does not specifically disclose determining a data rate indicator and a cell loading indicator. Rappaport et al. '555 does disclose, based on measured and predicted channel characteristics, determining a client throughput **(See pages 10-11 paragraph 83 and Figure 7 of Rappaport et al. '555 for reference to using channel characteristics in conjunction with look-up tables to determine a client throughput)**. Rappaport et al. '555 also does not specifically disclose determining client throughput by multiplying the capacity indicator by the data rate indicator and the cell loading indicator.

With respect to claims 2, 8, 14, and 20, Choi et al., in the field of communications, discloses determining a capacity based on path loss information **(See**

pages 1-2 paragraph 19 of Choi et al. for reference to determining both forward link capacity and backward link capacity based on path loss information). Using path loss information to determine capacity has the advantage of using an easy to calculate path loss metric to estimate a more difficult to calculate capacity metric.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Choi et al., to combine using path loss information to determine capacity, as suggested by Choi et al., with the system and method of Rappaport et al. '555, with the motivation being to use an easy to calculate path loss metric to estimate a more difficult to calculate capacity metric.

With respect to claims 2, 8, 14, and 20, Nelson et al., in the field of communications, discloses determining a data rate based on path loss information **(See the abstract of Nelson et al. for reference to determining an achievable data rate and allocating the determined rate based on a path loss parameter).** Determining an achievable data rate based on path loss information has the advantage of using an easy to calculate path loss metric to estimate the maximum achievable data rate.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Nelson et al., to combine using path loss information to determine an achievable data rate, as suggested by Nelson et al., with the system and method of Rappaport et al. '555 and Choi et al., with the motivation being to use an easy to calculate path loss metric to estimate the maximum achievable data rate.

With respect to claims 2, 8, 14, and 20, Rappaport et al. '547, in the field of communications, discloses determining a cell loading indicator **(See page 12 paragraph 103 of Rappaport et al. '547 for reference to predicting a loading characteristic)**. Determining a cell loading indicator has the advantage of allowing the use the knowledge of the number of clients connected to an access point to better determine client throughput.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Rappaport et al. '547, to combine determining a cell loading indicator, as suggested by Rappaport et al. '547, with the system and method of Rappaport et al. '555, Choi et al., and Nelson et al., with the motivation being to allow the use the knowledge of the number of clients connected to an access point to better determine client throughput.

With respect to claims 2, 8, 14, and 20, Chuang et al., in the field of communications discloses determining throughput based on multiplying capacity, rate, and cell loading indicators (See page 3 paragraphs 28-30 of Chuang et al. for reference to determining a throughput S by multiplying actual data transmission Rn, which is equivalent to a data rate times a capacity, by an interference ratio (1-BLERn(SIRo)), which is an cell loading indicator). Determining throughput based on multiplying capacity, rate, and cell loading indicators has the advantage of allowing a more accurate determination of the actual throughput to be calculated since data loss due to interference is taken into account.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Chuang et al., to combine determining throughput based on multiplying capacity, rate, and cell loading indicators, as suggested by Chuang et al., with the system and method of Rappaport et al. '555, Choi et al., Nelson et al., and Rappaport et al. '547, with the motivation being to allow a more accurate determination of the actual throughput to be calculated since data loss due to interference is taken into account.

5. Claims 3, 9, 15, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rappaport et al. (U.S. Publication US 2004/0259555 A1) in view of Choi et al. (U.S. Publication US 2004/0106410 A1), Nelson Jr., et al. (U.S. Publication US 2002/0159395), Rappaport et al. (U.S. Publication 2004/0236547 A1), and Chuang et al. (U.S. Publication 2005/0054296 A1) as applied to claims 2, 8, 14, and 20 above, and further in view of Edgar et al. (U.S. Pat. 5537530).

With respect to claims 3, 9, 15, and 21, Rappaport et al. '555 discloses repeating the determining of network characteristics and client throughputs for a plurality of clients **(See page 9 paragraph 74 and Figure 1 of Rappaport et al. '555 for reference to completing the steps of the method in Figure 1 for one or more selected points, which are client locations, meaning the multiple client locations are used)**. The combination of Rappaport et al. '555, Choi et al., Nelson et al., Rappaport et al. '547, and Chuang et al. does not disclose determining a combined quality metric as a reciprocal of an average of reciprocals of client throughputs.

With respect to claims 3, 9, 15, and 21, Edgar et al., in the field of communications, discloses determining a metric as a reciprocal of an average of reciprocals **(See column 11 lines 1-11 of Edgar et al. for reference to determining a metric as the reciprocal of the average of reciprocals of component metrics)**. Determining a metric as a reciprocal of an average of reciprocals has the advantage of emphasizing small differences over large in the average, as suggested by Edgar et al.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Edgar et al., to combine determining a metric as a reciprocal of an average of reciprocals, as suggested by Edgar et al., with the system and method of Rappaport et al. '555, Choi et al., Nelson et al., Rappaport et al. '547, and Chuang et al., with the motivation being to emphasize small differences over large in the average, as suggested by Edgar et al.

6. Claims 4, 10, 16, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rappaport et al. (U.S. Publication US 2004/0259555 A1) in view of Choi et al. (U.S. Publication US 2004/0106410 A1), Nelson Jr., et al. (U.S. Publication US 2002/0159395), Rappaport et al. (U.S. Publication 2004/0236547 A1), and Chuang et al. (U.S. Publication 2005/0054296 A1) as applied to claims 2, 8, 14, and 20 above, and further in view of Kamali et al. (U.S. Publication US 2004/0258000 A1).

With respect to claims 4, 10, 16, and 22, the combination of Rappaport et al. '555, Choi et al., Nelson et al., Rappaport et al. '547, Chuang et al. does not disclose determining a downstream capacity indicator, determining a separate upstream

indicator, and calculating the capacity indicator as a weighted sum of the downstream and upstream indicators.

With respect to claims 4, 10, 16, and 22, Kamali et al., in the field of communications, discloses determining a downstream capacity indicator, determining a separate upstream indicator, and calculating the capacity indicator as a weighted sum of the downstream and upstream indicators **(See page 4 paragraph 33 of Kamali et al. for reference to determining upstream and downstream capacity metrics and determining a combined capacity metric using a weighted sum of the upstream and downstream capacities)**. Determining a downstream capacity indicator, determining a separate upstream indicator, and calculating the capacity indicator as a weighted sum of the downstream and upstream indicators has the advantage of allowing either the upstream capacity or downstream capacity to have more weight in capacity indicator for better estimation of capacity usage in an asymmetric network.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Kamali et al., to combine determining a downstream capacity indicator, determining a separate upstream indicator, and calculating the capacity indicator as a weighted sum of the downstream and upstream indicators, as suggested by Kamali et al., with the system and method of Rappaport et al. '555, Choi et al., Nelson et al., Rappaport et al. '547, and Chuang et al., with the motivation being to allow either the upstream capacity or downstream capacity to have more weight in capacity indicator for better estimation of capacity usage in an asymmetric network.

1. Claims 5-6, 11-12, 17-18, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rappaport et al. (U.S. Publication US 2004/0259555 A1) in view of Choi et al. (U.S. Publication US 2004/0106410 A1), Nelson Jr., et al. (U.S. Publication US 2002/0159395), Rappaport et al. (U.S. Publication 2004/0236547 A1), Chuang et al. (U.S. Publication 2005/0054296 A1), and Kamali et al. (U.S. Publication US 2004/0258000 A1) as applied to claims 4, 10, 16, and 22 above, and further in view of Gustafsson et al. (U.S. Publication US 2003/0134641 A1).

With respect to claims 5, 11, 17, and 23, the combination of Rappaport et al. '555, Choi et al., Nelson et al., Rappaport et al. '547, Chuang et al., and Kamali et al. does not disclose that the downstream capacity indicator takes into account contention and collision with other access points and contention with clients other that the selected client.

With respect to claims 5, 11, 17, and 23, Gustafsson, in the field of communications, discloses determining downstream capacity taking into account contention and collision with other access points and contention with clients other that the selected client **(See page 4 paragraph 51-63 of Gustafsson for reference to determining downlink capacity taking into account interference, which inherently takes into account contention and collision considerations)**. Determining downstream capacity taking into account contention and collision with other access points and contention with clients other that the selected client has the advantage of

accurately modeling downstream capacity by taking downstream interference factors into account.

It would have been obvious for one or ordinary skill in the art at the time of the invention, when presented with the work of Gustafsson, to combine determining downstream capacity taking into account contention and collision with other access points and contention with clients other that the selected client, as suggested by Gustafsson, with the system and method of Rappaport et al. '555, Choi et al., Nelson et al., Rappaport et al. '547, Chuang et al., and Kamali et al., with the motivation being to accurately model downstream capacity by taking downstream interference factors into account.

With respect to claims 6, 12, 18, and 24, the combination of Rappaport et al. '555, Choi et al., Nelson et al., Rappaport et al. '547, Chuang et al., and Kamali et al. does not disclose that the upstream capacity indicator takes into account contention and collision with other access points.

With respect to claims 6, 12, 18, and 24, Gustafsson, in the field of communications, discloses determining upstream capacity taking into account contention and collision with other access points **(See pages 2-4 paragraph 28-50 of Gustafsson for reference to determining uplink capacity taking into account interference, which inherently takes into account contention and collision considerations)**. Determining upstream capacity taking into account contention and collision with other access points has the advantage of accurately modeling upstream capacity by taking upstream interference factors into account.

It would have been obvious for one or ordinary skill in the art at the time of the invention, when presented with the work of Gustafsson, to combine determining upstream capacity taking into account contention and collision with other access points, as suggested by Gustafsson, with the system and method of Rappaport et al. '555, Choi et al., Nelson et al., Rappaport et al. '547, Chuang et al., and Kamali et al., with the motivation being to accurately model upstream capacity by taking upstream interference factors into account.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason E. Mattis whose telephone number is (571) 272-3154. The examiner can normally be reached on M-F 8AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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